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1. A method of reconstructing a signal from a given set of data, with a prediction function representing a predictable effect on the signal, and a noise function representing unpredictable noise, the method comprising the steps of:
 - altering the coordinate basis of the data and signal from an original coordinate basis in order to produce a prediction function having a reduced set of variables;
 - performing a Bayesian reconstruction capable of operation of positive, negative, and complex signal values to produce a reconstruction signal; and
 - converting the reconstruction signal back into the original coordinate basis to generate a signal.
2. A method according to claim 1, wherein the Bayesian reconstruction is performed using a Fourier basis.
3. A method according to claim 1, wherein the Bayesian reconstruction is performed using a wavelet basis.

A marked up version of claim 4 follows:

Claim 4 (Amended/Marked up) A method according to [any preceding claim 1, wherein the Bayesian reconstruction employs [the] a maximum entropy method.

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5. A method according to claim 4, employing an evaluation parameter, α , which is determined from a prior reconstruction.

30 6. A method according to claim 4, employing an evaluation parameter, α , which is set at a fixed value.

7. A method according to claim 4, employing an evaluation parameter, α , which is determined during the reconstruction
15 step.

A marked up version of claim 8 follows:

Claim 8. (Amended/Marked up) A method according to [any of]
7], [in which] wherein the signal to be reconstructed is an image signal.

9. A method according to claim 8, wherein the image
5 signal is a medical image signal.

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A marked up version of claim 10 follows:

Claim 10. (Amended/Marked up) A method according to [any of]
7], [in which] wherein the signal to be reconstructed is a radar signal.

A marked up version of claim 11 follows:

Claim 11. (Amended/Marked up) A method according to [any of]
7], [in which] wherein the signal to be reconstructed is an acoustic data signal.

12. A method according to claim 11, wherein the acoustic data signal is an underwater sonar signal.

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13. A method according to claim 11, wherein the acoustic data signal is a geophysical data signal.

A marked up version of claim 14 follows:

Claim 14. (Amended/Marked up) A method according to [any of] claim 7], [in which] wherein the signal to be reconstructed is a signal from spectroscopy.

A marked up version of claim 15 follows:

Claim 15. (Amended/Marked up) A method according to [any of] claim 7], [in which] wherein the signal is a communication signal[, such as a time-series signal]